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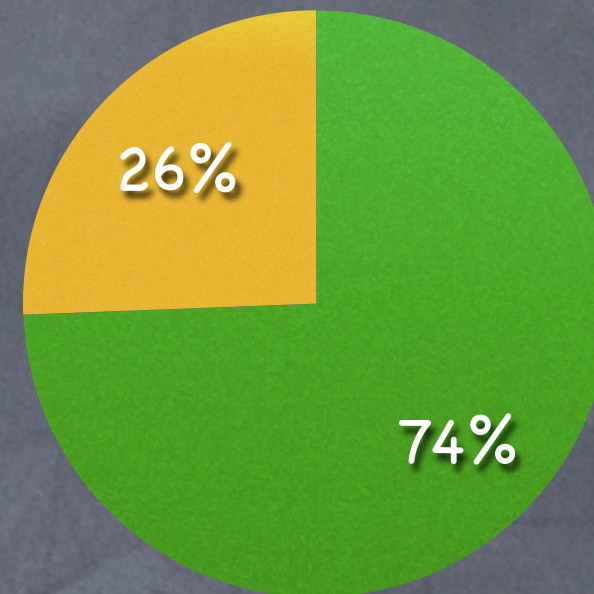
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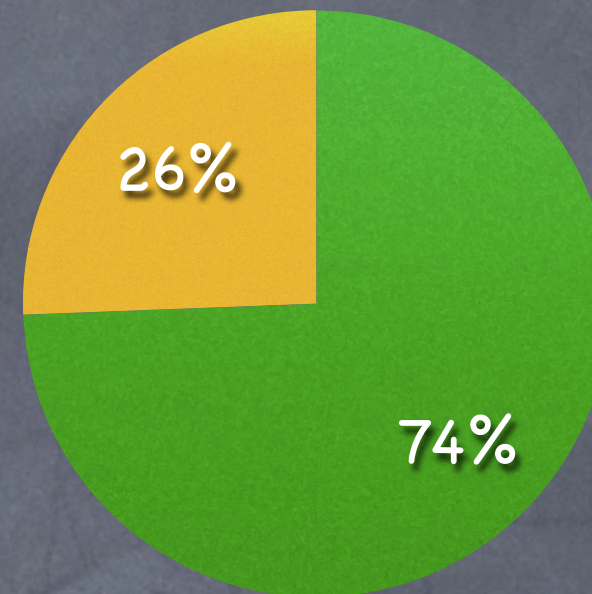
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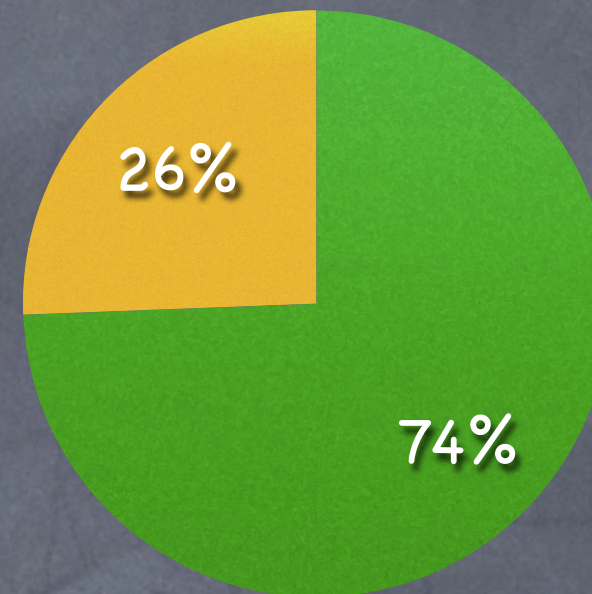
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step 3: make certain the percentages add up to 100





# Practice Problem #1

Find the percentage composition for each element in:  
iron (III) silicate





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$$\text{Fe: } 2 \times 55.8 = 111.6$$

$$\text{Si: } 3 \times 28.1 = 84.3$$



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$$\text{Fe: } 2 \times 55.8 = 111.6$$

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$$\text{O: } 9 \times 16.0 = 144.0$$



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$$= 339.9$$



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$$\text{Fe} = 32.9\%; \text{ Si} = 24.8\%; \text{ O} = 42.4\%$$



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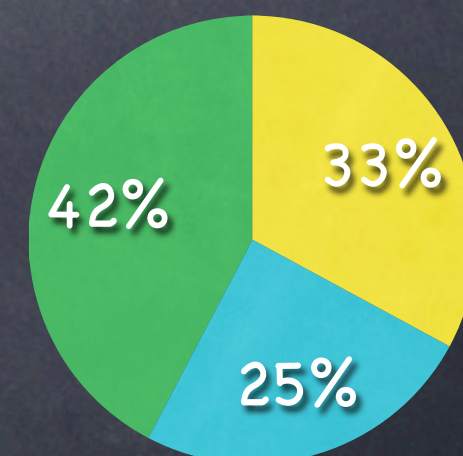
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## Practice Problem #2

tin (IV) arsenate =  $\text{Sn}_3(\text{AsO}_4)_4$



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## Practice Problem #2



$$\text{Sn: } 3 \times 118.7 = 356.1$$

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$$\text{Sn: } 3 \times 118.7 = 356.1$$

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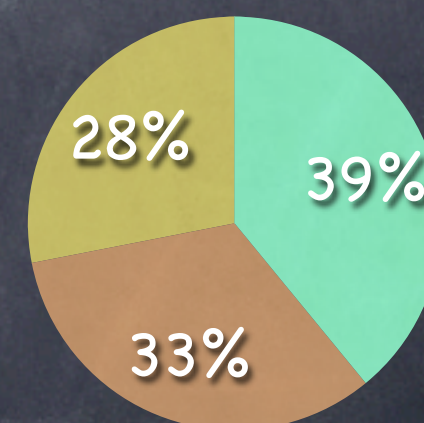
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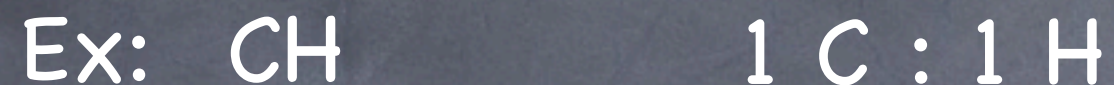
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So, several molecular compounds can have the same empirical formula



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$$\text{Na} = 1.58/0.791 = 2$$



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49.0% C, 2.70% H, 48.2% Cl



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Given the following data, find the correct empirical formula:

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$$2.7 \text{ g H} \times \frac{1 \text{ mol}}{1.0 \text{ g}} = 2.70 \text{ mol}$$



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Given the following data, find the correct empirical formula:

49.0% C, 2.70% H, 48.2% Cl

$$49.0 \text{ g C} \times \frac{1 \text{ mol}}{12.0 \text{ g}} = 4.1 \text{ mol}$$

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Given the following data find the empirical formula:

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$$\text{CH}_2\text{Cl} = 12.0 + 2.0 + 35.5 = 49.5 \text{ g}$$



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$$2.0/2.0 = 1$$

2) Divide the M.F. mass by the E.F. mass:

$$\text{CH}_2\text{Cl} = 12.0 + 2.0 + 35.5 = 49.5 \text{ g}$$

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2) Divide the M.F. mass by the E.F. mass:

$$\text{CH}_2\text{Cl} = 12.0 + 2.0 + 35.5 = 49.5 \text{ g}$$

$$99.0/49.5 = 2$$

$$\text{M.F.} = \text{C}_2\text{H}_4\text{Cl}_2$$



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Given the following data, find the correct molecular formula:

54.6% C, 9.00% H, 36.4% O and a molecular mass of 176



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1) Find the empirical formula:  $= \text{C}_2\text{H}_4\text{O}$

$$54.6 \text{ g C} \times \frac{1 \text{ mol C}}{12.0 \text{ g}} = 4.6 \text{ mol}$$

$$4.6/2.3 = 2$$

$$9.0 \text{ g H} \times \frac{1 \text{ mol H}}{1.0 \text{ g}} = 9.0 \text{ mol}$$

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$$36.4 \text{ g O} \times \frac{1 \text{ mol O}}{16.0 \text{ g}} = 2.3 \text{ mol}$$

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## Practice Problem #2

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$$\text{C}_2\text{H}_4\text{O} = 24.0 + 4.0 + 16.0 = 44.0\text{g}$$



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$$\text{M.F.} = \text{C}_8\text{H}_{16}\text{O}_4$$



Summary:

What is the empirical formula for  $\text{H}_2\text{O}_2$ ?

What is the empirical formula for  $\text{C}_2\text{H}_2$   
and  $\text{C}_8\text{H}_8$ ?

A compound has a mass of 91.0g. It's  
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